PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title:	SINGLE BOARD ROUTING ARRANGEMENT		

CERTIFICATE UNDER 37 CFR 1.8 I hereby certify that this correspondence is being transmitted via the United States Patent and Trademark Office electronic filing system on 10-30-08.

By: Carol Anderson

Name: Carol Anderson

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450,
Alexandria, VA 22313

Sir:

This is an Appeal Brief responsive to the Final Office Action mailed on July 31, 2008. Appellant filed a Notice of Appeal on September 30, 2008. Accordingly, the deadline for this Appeal Brief is October 31, 2008.

Please charge Deposit Account No. 50-1778 in the amount of $540.00 for Appellant's Appeal Brief fee for large entity.

Please charge any additional fees that may be required or credit any overpayment to Deposit Account No. 50-1778.

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REAL PARTY IN INTEREST

The real party in interest is Juniper Networks, Inc., of Sunnyvale, California, the assignee of record.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 are on Appeal in this case.[1] Claims 2–5, 9, 16–18, 21–24, 26–28, 31, 33–38, 45, 47–55, 57–59, 72–76, 81, 83, and 85 have been canceled. The pending claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 are set forth in the attached Claims Appendix.

Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention.

Claims 1, 6–8, 10–14, 19–20, 25, 29–30, 32, 39–44, 56, 60, 61, 63–71, 77–79, 82, 84, and 86 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,218,632 to Bechtolsheim (filed Dec. 6, 2000, issued May 15, 2007; *hereinafter* "Bechtolsheim") in view of U.S. Patent No. 5,918,021 to Aditya (filed June 3, 1996, issued June 29, 1999; *hereinafter* "Aditya"), and further in view of U.S. Patent No. 6,826,195 to Nikolich et al. (filed Dec. 28, 1999, issued Nov. 30, 2004; *hereinafter* "Nikolich").

Claims 15, 46, 62 and 80 stand rejected under 35 U.S.C. § 103(a) as being obvious over Bechtolsheim in view of Aditya, and in further view of Nikolich and U.S. Patent Application Publication No. 2005/0010695 to Coward et al. (filed Aug. 12, 2004, published Jan. 13, 2005, continuation of 09/688,859 filed Oct. 17, 2000; *hereinafter* "Coward").

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[1] Appellant notes that the Examiner incorrectly stated the pending claims in the Final Office Action dated July 31, 2008 as claims 1, 2, 6-8, 10-17, 19-21, 23-33, 39-44, 46-48, 52-58, 60-71, and 77-86, at p. 1.

STATUS OF AMENDMENTS

No amendments have been filed since the Final Office Action mailed on July 31, 2008. Claims 1, 11, 14, 19, 20, 25, 29–30, 32, 56, 60–63, 71, 77, 82, and 86 were amended in the Amendment filed on April 7, 2008 in response to the non-final Office Action mailed on Jar. 8, 2008. Claims 2, 9, 16–17, 21, 23–24, 26–28, 31, 33, 47–48, 52–55, 57–58, 81, 83, and 85 were canceled in the same amendment.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 recites a routing device.[2] The routing device comprises a midplane;[3] a power supply coupled to the midplane to supply power along the midplane;[4] a plurality of removable interface cards[5] removably coupled to the midplane[6] to communicate packets using a network;[7] a router module removably coupled[8] to the midplane separate from the plurality of removable interface cards,[9] the router module comprising a packet forwarding engine,[10] memory,[11] a memory management unit,[12] and an interface card concentrator module[13] wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit,[14] wherein the midplane provides power from the power supply to the router module only when the router module is properly inserted into the midplane,[15] wherein the interface card concentrator module receives packets from at least two of the removable interface cards,[16] wherein contents of the received packets are stored in the memory,[17] wherein

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[2] Specification, FIG. 1; p. 5, ll. 15–16.
[3] Specification, FIG. 2, elt. 208; p. 5, ll. 29–31.
[4] Specification, p. 9, ll. 18–20.
[5] Specification, FIG. 1; p. 5, ll. 18–19; *see also* p. 11, l. 28.
[6] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31; p. 11, l. 28.
[7] Specification, p. 5, ll. 29–30.
[8] *See* Specification, p. 10, ll. 3–6 (noting that the routing engine must be "properly and fully inserted").
[9] Specification, FIG. 2; p. 11, ll. 23–25 (stating that the router is connected to the interface cards "via midplane 704 and switch 710"); ll. 26–28 ("[I]nterface cards 702 are connected to the front of midplane 704 and router 706 is connected to the rear of midplane 704.").
[10] Specification, FIG. 1, elt. 16; p. 5, ll. 17–18.
[11] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.
[12] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[13] Specification, FIG. 2, elt. 205; p. 6, ll. 8–14 (as amended by Amendment filed June 7, 2006).
[14] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[15] Specification, p. 10, ll. 3–7.
[16] Specification, p. 6, ll. 11–15.
[17] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.

the memory management unit generates notifications based on keys of the received packets[18] and forwards the notifications to the packet forwarding engine,[19] wherein the packet forwarding engine performs route lookups for the packets based on the keys in response to the notifications,[20] wherein the interface card concentrator module sends the packets from the memory[21] to the removable interface cards as output bound packets[22] based on the route lookups performed by the packet forwarding engine[23] in response to the notifications.[24]

Claim 32 recites a routing arrangement.[25] The routing arrangement comprises a crossbar arrangement;[26] and a plurality of routing devices coupled to the crossbar arrangement,[27] at least one routing device[28] comprising: a midplane;[29] a power supply coupled to the midplane to supply power along the midplane;[30] a plurality of removable interface cards[31] removably coupled to the midplane[32] to communicate data packets using a network;[33] and a router module removably coupled[34] to the midplane separate from the plurality of removable interface cards,[35] wherein the midplane provides power to the router module from the power supply, only when the midplane is properly inserted into the midplane,[36] wherein the router module performs route lookups for a first set of the data packets received from the network by a first one of the removable interface cards and for a second set of the data packets received from the network by a second one of the removable interface cards[37] to select routes for the data packets and to forward the data packets

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[18] Specification, p. 8, ll. 24–27.
[19] Specification, p. 8, l. 27.
[20] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[21] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[22] Specification, p. 9, ll. 13–17.
[23] Specification, p. 9. ll. 3–5.
[24] Specification, p. 9, l. 10.
[25] Specification, p. 10, l. 30–p. 11, l. 1.
[26] Specification, p. 10, l. 31.
[27] Specification, p. 10, ll. 30–31.
[28] Specification, FIG. 1; p. 5, ll. 15–16.
[29] Specification, FIG. 2, elt. 208; p. 5, ll. 29–31.
[30] Specification, p. 9, ll. 18–20.
[31] Specification, FIG. 1; p. 5, ll. 18–19; *see also* p. 11, l. 28.
[32] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31; p. 11, l. 28.
[33] Specification, p. 5, ll. 29–30.
[34] *See* Specification, p. 10, ll. 3–6 (noting that the routing engine must be "properly and fully inserted").
[35] Specification, FIG. 2; p. 11, ll. 23–25 (stating that the router is connected to the interface cards "via midplane 704 and switch 710"); ll. 26–28 ("[I]nterface cards 702 are connected to the front of midplane 704 and router 706 is connected to the rear of midplane 704.").
[36] Specification, p. 10, ll. 3–7.
[37] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.

between the removable interface cards,[38] wherein the router module comprises a system control module that performs the route lookups,[39] memory,[40] a memory management circuit,[41] and at least one concentrator module[42] that receives the data packets from at least the first one and the second one of the removable interface cards,[43] and wherein the system control module, the memory management circuit, and the concentrator module are integrated into a single unit,[44] wherein the router module receives packets from at least two of the removable interface cards,[45] wherein contents of the received packets are stored in the memory,[46] wherein the memory management circuit generates notifications based on keys of the received packets[47] and forwards the notifications to the system control module,[48] wherein the system control module performs route lookups for the packets based on the keys in response to the notifications,[49] and wherein the concentrator module sends the packets from the memory[50] to the removable interface cards[51] as output bound packets based on the route lookups performed by the system control module[52] in response to the notifications.[53]

Claim 63 recites a router.[54] The router comprises a midplane,[55] a plurality of interface cards coupled to the midplane,[56] a power supply to provide power along the midplane,[57] and one hardware board[58] integrally housing an interface concentrator[59] that provides electrical interfaces to connect to the midplane[60] to receive incoming packets from the plurality of interface cards via

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[38] Specification, p. 6, ll. 26–28.
[39] Specification, FIG. 2; p. 2, ll. 23–24; p. 6, ll. 23–25.
[40] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.
[41] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[42] Specification, FIG. 2, elt. 205; p. 6, ll. 8–14 (as amended by Amendment filed June 7, 2006).
[43] Specification, p. 6, ll. 8–9.
[44] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[45] Specification, p. 6, ll. 11–15.
[46] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.
[47] Specification, p. 8, ll. 24–27.
[48] Specification, p. 8, l. 27.
[49] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[50] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[51] Specification, p. 9, ll. 13–17.
[52] Specification, p. 9. ll. 3–5.
[53] Specification, p. 9, l. 10.
[54] Specification, FIG. 1; p. 5, ll. 15–16.
[55] Specification, FIG. 2, elt. 208; p. 5, ll. 29–31.
[56] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31.
[57] Specification, p. 9, ll. 18–20.
[58] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[59] Specification, FIG. 2, elt. 205; p. 6, ll. 8–14 (as amended by Amendment filed June 7, 2006).
[60] Specification, p. 10, ll. 13–19.

the midplane,[61] a packet processing circuit,[62] memory,[63] a memory management circuit,[64] and a route lookup circuit[65] separate from the interface cards[66] to perform route lookups to select routes for a first packet and a second of the incoming packets received from a network by different ones of the plurality of interface cards[67] wherein the midplane is configured to provide power to the one hardware board from the power supply,[68] only when the one hardware board is properly connected to the midplane at the electrical interfaces,[69] wherein the interface concentrator receives the data packets from at least two of the interface cards,[70] wherein contents of the received data packets are stored in the memory,[71] wherein the memory management circuit generates notifications based on keys of the received data packets[72] and forwards the notifications to the route lookup circuit,[73] wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications,[74] and wherein the interface concentrator sends the data packets from the memory[75] to the interface cards as output bound packets[76] based on the route lookups performed by the route lookup circuit[77] in response to the notifications.[78]

Claim 71 recites a method of manufacturing a routing device.[79] The method comprises providing a plurality of interface modules to communicate data packets using a network;[80] coupling a midplane to the plurality of interface modules;[81] coupling a power supply to the

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[61] Specification, p. 5, ll. 29–31.
[62] Specification, FIG. 2, elt. 210; p. 6, ll. 12–14.
[63] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.
[64] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[65] Specification, FIG. 1, elt. 16; p. 5, ll. 17–18.
[66] Specification, FIG. 2; p. 11, ll. 23–25 (stating that the router is connected to the interface cards "via midplane 704 and switch 710"); ll. 26–28 ("[I]nterface cards 702 are connected to the front of midplane 704 and router 706 is connected to the rear of midplane 704.").
[67] Specification, p. 6, ll. 14–15.
[68] Specification, p. 9, ll. 18–20.
[69] Specification, p. 10, ll. 3–7.
[70] Specification, p. 6, ll. 11–15.
[71] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.
[72] Specification, p. 8, ll. 24–27.
[73] Specification, p. 8, l. 27.
[74] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[75] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[76] Specification, p. 9, ll. 13–17.
[77] Specification, p. 9. ll. 3–5.
[78] Specification, p. 9, l. 10.
[79] Specification, FIG. 1; p. 5, ll. 15–16.
[80] Specification, FIG. 1, elts. 18; FIG. 2, elts. 206; FIG. 3, elts. 306; p. 5, ll. 29–30.
[81] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31; p. 11, l. 28.

midplane;[82] and coupling a single router module to the midplane,[83] wherein the midplane is configured to provide power to the single router module from the power supply,[84] only when the single router module is properly inserted into the midplane,[85] wherein the router module is configured to perform route lookups for data packets[86] received from different ones of the interface modules via the midplane to select routes for the packets in accordance with route information associated with the network[87] and forward the packets back to the interface modules by way of the midplane,[88] and wherein the router module comprises a system control module,[89] memory,[90] a memory management unit,[91] and at least one concentrator module[92] integrated into a single unit separate from the interface modules[93] wherein the concentrator module receives the data packets from at least two of the interface cards,[94] wherein contents of the received data packets are stored in the memory,[95] wherein the memory management circuit generates notifications based on keys of the received data packets[96] and forwards the notifications to the system control module,[97] wherein the system control module performs route lookups for the data packets based on the keys in response to the notifications,[98] and wherein the interface concentrator module sends the data packets from the memory[99] to the interface cards as output bound packets[100] based on the route lookups performed by the system control module[101] in response to the notifications.[102]

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[82] Specification, p. 9, ll. 18–20.
[83] *See* Specification, p. 10, ll. 3–6 (noting that the routing engine must be "properly and fully inserted").
[84] Specification, p. 9, ll. 18–20.
[85] Specification, p. 10, ll. 3–7.
[86] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[87] Specification, p. 6, ll. 26–28.
[88] Specification, p. 9, ll. 13–17.
[89] Specification, FIG. 2; p. 2, ll. 23–24; p. 6, ll. 23–25.
[90] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.
[91] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[92] Specification, FIG. 2, elt. 205; p. 6, ll. 8–14 (as amended by Amendment filed June 7, 2006).
[93] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[94] Specification, p. 6, ll. 11–15.
[95] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.
[96] Specification, p. 8, ll. 24–27.
[97] Specification, p. 8, l. 27.
[98] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[99] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[100] Specification, p. 9, ll. 13–17.
[101] Specification, p. 9. ll. 3–5.
[102] Specification, p. 9, l. 10.

Claim 82 recites a method of manufacturing a routing arrangement.[103] The method comprises providing a crossbar arrangement;[104] and coupling a plurality of routing devices to the crossbar arrangement,[105] at least one routing device comprising a midplane;[106] a plurality of interface cards[107] to communicate data packets using a network,[108] wherein each of the plurality of interface cards are coupled to the midplane;[109] a power supply coupled to the midplane to supply power along the midplane;[110] and a router module separate from the plurality of interface cards[111] to process the data packets and to forward the data packets between the interface cards,[112] wherein the router module is coupled to the midplane,[113] wherein the midplane is configured to provide power to the router module from the power supply, only when the router module is properly inserted into the midplane,[114] wherein the router module is configured to perform route lookups for the data packets received from different ones of the interface cards[115] to select routes for the packets in accordance with route information associated with the network,[116] wherein the router module includes a packet processing circuit,[117] memory,[118] a memory management circuit,[119] and a route lookup circuit integrated into a single module,[120] wherein the packet processing circuit receives the data packets from at least two of the interface cards,[121] wherein contents of the received data packets are stored in the memory,[122] wherein the memory management circuit generates notifications based on keys of the received data packets[123]

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[103] Specification, FIG. 1; p. 5, ll. 15–16.
[104] Specification, p. 10, l. 31.
[105] Specification, p. 10, ll. 30–31.
[106] Specification, FIG. 2, elt. 208; p. 5, ll. 29–31.
[107] Specification, FIG. 1; p. 5, ll. 18–19; *see also* p. 11, l. 28.
[108] Specification, p. 5, ll. 29–30.
[109] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31; p. 11, l. 28.
[110] Specification, p. 9, ll. 18–20.
[111] Specification, FIG. 2; p. 11, ll. 23–25 (stating that the router is connected to the interface cards "via midplane 704 and switch 710"); ll. 26–28 ("[I]nterface cards 702 are connected to the front of midplane 704 and router 706 is connected to the rear of midplane 704.").
[112] Specification, p. 6, ll. 26–28.
[113] *See* Specification, p. 10, ll. 3–6 (noting that the routing engine must be "properly and fully inserted").
[114] Specification, p. 10, ll. 3–7.
[115] Specification, p. 6, ll. 8–9.
[116] Specification, p. 6, ll. 26–28.
[117] Specification, FIG. 2; p. 2, ll. 23–24; p. 6, ll. 23–25.
[118] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.
[119] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[120] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[121] Specification, p. 6, ll. 11–15.
[122] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.
[123] Specification, p. 8, ll. 24–27.

and forwards the notifications to the route lookup circuit,[124] wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications,[125] and wherein the packet processing circuit sends the data packets from the memory[126] to the interface cards[127] as output bound packets based on the route lookups performed by the route lookup circuit[128] in response to the notifications.[129]

Claim 84 recites a routing arrangement.[130] The routing arrangement comprises a plurality of routing devices coupled in a crossbar arrangement,[131] at least one routing device comprising a midplane,[132] a plurality of interface modules[133] removably coupled to the midplane[134] to communicate data packets using a network,[135] a power supply coupled to the midplane to provide power along the midplane,[136] a router module removably coupled to the midplane[137] to receive the data packets from at least two different ones of the interface modules,[138] wherein the router module is configured to perform route lookups for the data packets received from the at least two interface modules[139] to select routes for the packets in accordance with route information associated with the network,[140] wherein the midplane is configured to provide power to single router module from the power supply, only when the router module is properly inserted into the midplane;[141] and a switch arrangement coupled to the plurality of routing devices and configured to switch control from a first routing device to a second routing device,[142] wherein the router module includes a packet processing circuit,[143] memory,[144] a memory management

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[124] Specification, p. 8, l. 27.
[125] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[126] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[127] Specification, p. 9, ll. 13–17.
[128] Specification, p. 9. ll. 3–5.
[129] Specification, p. 9, l. 10.
[130] Specification, FIG. 1; p. 5, ll. 15–16.
[131] Specification, p. 10, ll. 30–31.
[132] Specification, FIG. 2, elt. 208; p. 5, ll. 29–31.
[133] Specification, FIG. 1; p. 5, ll. 18–19; *see also* p. 11, l. 28.
[134] Specification, FIG. 2, elts. 208 and 206; p. 5, ll. 30–31; p. 11, l. 28.
[135] Specification, p. 5, ll. 29–30.
[136] Specification, p. 9, ll. 18–20.
[137] *See* Specification, p. 10, ll. 3–6 (noting that the routing engine must be "properly and fully inserted").
[138] Specification, p. 6, ll. 11–15.
[139] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[140] Specification, p. 6, ll. 26–28.
[141] Specification, p. 10, ll. 3–7.
[142] Specification, p. 6, ll. 5–7; p. 11, ll. 10–13.
[143] Specification, FIG. 2, elt. 210; p. 6, ll. 12–14.
[144] Specification, FIG. 2, elt. 212; FIG. 3, elt. 312; p. 6, ll. 9–11; p. 7, ll. 24–31.

circuit,[145] and a route lookup circuit[146] integrated into a single module,[147] wherein the packet processing circuit receives the data packets from at least two of the interface cards,[148] wherein contents of the received data packets are stored in the memory,[149] wherein the memory management circuit generates notifications based on keys of the received data packets[150] and forwards the notifications to the route lookup circuit,[151] wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications,[152] and wherein the packet processing circuit sends the data packets from the memory[153] to the interface cards as output bound packets[154] based on the route lookups performed by the route lookup circuit[155] in response to the notifications.[156]

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellant submits the following grounds of rejection to be reviewed on Appeal:

(1) The first ground of rejection to be reviewed is the rejection of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

(2) The second ground of rejection to be reviewed is the rejection of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention.

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[145] Specification, FIG. 2, elts. 214 and 216; FIG. 3, elts. 314 and 316; p. 6, ll. 18–19; p. 7, ll. 24–25.
[146] Specification, FIG. 1, elt. 16; p. 5, ll. 17–18.
[147] Specification, FIG. 2; p. 2, ll. 23–24; *see also* p. 5, l. 28–p. 7, l. 2.
[148] Specification, p. 6, ll. 11–15.
[149] Specification, p. 6, ll. 19–21; p. 7, ll. 27–28.
[150] Specification, p. 8, ll. 24–27.
[151] Specification, p. 8, l. 27.
[152] Specification, p. 6, ll. 23–25; p. 8, ll. 27–29.
[153] Specification, p. 6, ll. 21–22; p. 7, ll. 29–31; p. 9, ll. 10–11.
[154] Specification, p. 9, ll. 13–17.
[155] Specification, p. 9. ll. 3–5.
[156] Specification, p. 9, l. 10.

(3) The third ground of rejection to be reviewed is the rejection of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 103(a) as being obvious in view of Bechtolsheim, Aditya, Nikolich, and Coward.

ARGUMENT

In the Final Office Action, the Examiner rejected claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner also rejected claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. The Examiner also rejected claims 1, 6–8, 10–14, 19–20, 25, 29–30, 32, 39–44, 56, 60, 61, 63–71, 77–79, 82, 84, and 85 under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 7,218,632 to Bechtolsheim (filed Dec. 6, 2000, issued May 15, 2007; *hereinafter* "Bechtolsheim") in view of U.S. Patent No. 5,918,021 to Aditya (filed June 3, 1996, issued June 29, 1999; *hereinafter* "Aditya"), and further in view of U.S. Patent No. 6,826,195 to Nikolich et al. (filed Dec. 28, 1999, issued Nov. 30, 2004; *hereinafter* "Nikolich"). The Examiner also rejected claims 15, 46, 62 and 80 under 35 U.S.C. § 103(a) as being obvious in view of Bechtolsheim, Aditya, Nikolich, and in further view of U.S. Patent Application Publication No. 2005/0010695 to Coward et al. (filed Aug. 12, 2004, published Jan. 13, 2005, continuation of 09/688,859 filed Oct. 17, 2000; *hereinafter* "Coward").

Appellant respectfully traverses the current rejections advanced in the Final Office Action, and requests reversal by the Board of Patent Appeals based on the arguments below. Appellant respectfully requests separate review by the Board for each of Groups 1–3 addressed below under separate headings.

The Patent Examiner bears the burden of proof to demonstrate a prima facie case that an invention is not patentable.[157] In reviewing an Examiner's decision on Appeal, the Board must consider all of the evidence, and patentability is determined by a preponderance of the evidence with due consideration to persuasiveness of argument.[158]

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[157] *See In re Oetiker*, 977 F.2d 1443.
[158] *Id.*

The Supreme Court recently clarified the standard of non-obviousness under 35 U.S.C. 103(a) in *KSR Int'l Co. v. Teleflex, Inc.*[159] As reiterated by the Supreme Court in *KSR International Co.* v. *Teleflex Inc.* (KSR),[160] the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham* v. *John Deere Co.*[161] Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

(1) Determining the scope and content of the prior art;

(2) Ascertaining the differences between the claimed invention and the prior art; and

(3) Resolving the level of ordinary skill in the pertinent art.

In *KSR*, the Supreme Court explained that the Examiner must identify a logical reason why a person of ordinary skill in the art would have been led to make a modification or combination to arrive at the claimed invention. An invention composed of several elements is not proved obvious merely by demonstrating that each of the elements was independently known.[162]

Consistent with *KSR*, the Federal Circuit has stated that there must be "some rationale, articulation, or reasoned basis" to support the legal conclusion of obviousness."[163] The reason for modification need not conform to the particular motivation or objective of the patent applicant.[164] However, there still must be some need or problem known in the art that would have provided a reason for combining elements in the manner claimed.[165]

Furthermore, a basic premise of the obviousness analysis set forth in *KSR* is that the combination of prior art references must actually disclose the elements recited in the claims. Consistent with this premise, the Manual for Patenting Examining Procedure (MPEP) sets forth three basic requirements to an obviousness analysis as follows.[166] First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally

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[159] *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. ____ (case 04-1350) (April 30, 2007).
[160] 550 U.S. _, 82 USPQ2d 1385 (2007).
[161] 383 U.S. 1, 148 USPQ 459 (1966).
[162] *KSR*, Slip op. at 14.
[163] *Alza Corp. v. Mylan Laboratories*, 80 USPQ2d 1001, 1005 (Fed. Cir. 2006) (citing *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006)).
[164] *KSR*, Slip op. at 16.
[165] *Id.*
[166] See MPEP 2143.

available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.[167]

The *KSR* case clarified that the "suggestion or motivation" requirement is more broadly a requirement that the Examiner articulate a "rational reason" for the modification. However, the *KSR* case did not modify the basic requirement of the obviousness analysis that requires the Examiner to show that the prior art collectively teaches the elements of Appellant's claims. Accordingly, if Appellant can show that the prior art lacks a teaching of one or more elements of the pending claims, the obviousness rejections must be reversed. In addition, if there is no *rational* reason a person of ordinary skill in the art would have arrived at the claimed invention in view of the prior art, the obviousness rejections must be reversed.

FIRST GROUND OF REJECTION UNDER APPEAL

GROUP 1—(Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86)

In the Final Office Action, the Examiner rejected claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, first paragraph as lacking support in the Written Description. In particular, the Examiner stated that all of the claims, specifically all the independent claims, require "wherein the interface card concentrator module sends the packets from the memory." The Examiner stated that the Written Description does not support that the memory to which received packets were stored is the same memory from which the received packets are sent as outbound packets. The Examiner has committed technical error in this determination.

35 U.S.C. 112, first paragraph, requires "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention."

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[167] See MPEP 2143.

The claim element in question is supported throughout the Written Description. For example, figure 2 of the specification, reproduced below, depicts router 200 as having memory 212 and memory 228:

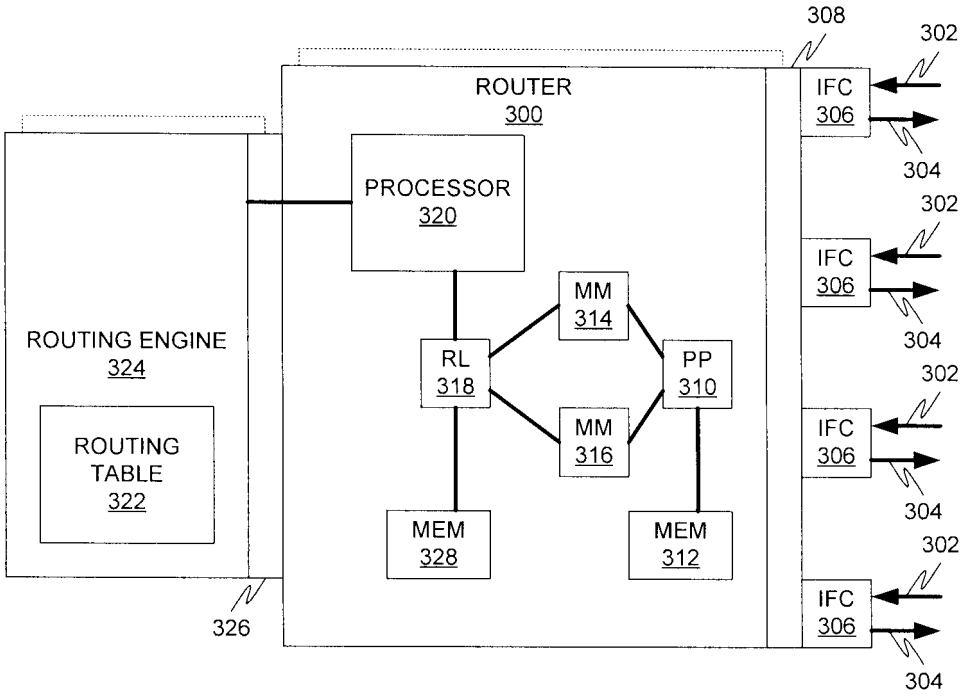

FIG. 3

The Written Description discusses router 300 that includes memory 312, with reference to figure 3, above. The Written Description states, "The interface card concentrator may perform additional functions related to communicating data packets to and from IFCs 306, including, for example, storing the data packets in memory 312."[168] Additionally, the Written Description states, "In connection with assembling outbound packets, packet processing ASIC 310 reads data from memory 312."[169] Moreover, the Written Description states, "[M]emory management ASIC 316 writes the processed packet contents to memory 312 associated with packet processing ASIC 310. When packet processing ASIC 310 prepares an outgoing data packet for transmission using

[168] Specification, p. 7, ll. 15–17.
[169] Specification, p. 7, ll. 21–23.

the network, memory management ASIC 314 reads the data to be assembled into the outgoing packet from memory 312 associated with packet processing ASIC 310."[170]

The Written Description therefore supports the elements of the pending claims. In particular, the Written Description provides support for the requirements "wherein contents of the received packets are stored in the memory" and "wherein the interface card concentrator module sends the packets from the memory" of claim 1, for example, as required by 35 U.S.C. § 112, first paragraph. Moreover, one of ordinary skill in the art, upon reading the Written Description, would understand that data (such as a packet) can only be read from a memory if it is first stored to the memory. It is nonsensical to presume that one of ordinary skill in the art would even consider the possibility of reading data from a memory to which that data had not first been written. Similar arguments apply with respect to claims 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86.

Accordingly, the rejections of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, first paragraph, are improper and must be reversed.

SECOND GROUND OF REJECTION UNDER APPEAL

Group 2—(Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86)

In the Final Office Action, the Examiner rejected claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. In particular, the Examiner stated that it was unclear whether the claims recited one memory or two. As discussed above with respect to the First Ground of Rejection Under Appeal, the Written Description provides support for the claims as written, in particular that there is one memory to which received packets are received and from which packets are sent. Similar arguments apply with respect to the Second Ground of Rejection Under Appeal. The rejections under 35 U.S.C. § 112, second paragraph, are in error and must be reversed.

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[170] Specification, p. 7, ll. 27–31.

Although the figures show multiple memories (e.g., two memories 212 in figure 2; memory 312 and memory 328 in FIG. 3), the Written Description states these memories exist for different purposes. Two memories 212 are shown in figure 2 because there are two distinct packet processing ASICs 210, each with their own memory 212.[171] The Written Description specifically states, "Each packet processing ASIC 210 can process inbound and outbound data for up to four IFCs 206."[172] Therefore, each of ASICs 210 is associated with a distinct memory 212, as shown in figure 2.

The Written Description, with respect to figure 3, also states a reason for multiple memories, i.e. memory 312 and memory 328. In particular, the Written Description states that memory 312 stores received packets that may subsequently be read, i.e. when the packets are to be sent.[173] The Written Description states that memory 328, on the other hand, stores selected routes from routing table 322 in the form of a forwarding table.[174] Accordingly, the Written Description supports that memory 328 and memory 312 are present for distinct purposes, and that data is written to, and subsequently read from, memory 312. Therefore, the requirements of claim 1, for example, that a router module comprises a memory, wherein contents of the received packets are stored in the memory, and wherein the interface card concentrator module sends the packets from the memory to the removable interface cards as output bound packets based on the route lookups performed by the packet forwarding engine in response to the notifications, are distinctly claimed, and the memory recited by claim 1 should not be treated as two distinct memories, as the Examiner proposed in the Final Office Action.[175]

For at least these reasons, the claims satisfy the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, the rejections of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 112, second paragraph, are improper and must be reversed.

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[171] Specification, p. 6, ll. 11–14.
[172] Specification, p. 6, ll. 14–15.
[173] Specification, p. 7, ll. 14–23.
[174] Specification, p. 8, ll. 8–10; *see also, e.g.*, claim 13.
[175] *See, e.g.*, Final Office Action dated July 31, 2008, p. 4.

THIRD GROUND OF REJECTION UNDER REVIEW

Group 3—(Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86)

In the Final Office Action, the Examiner rejected claims 1, 6–8, 10–14, 19–20, 25, 29–30, 32, 39–44, 56, 60, 61, 63–71, 77–79, 82, 84, and 86 under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 7,218,632 to Bechtolsheim (filed Dec. 6, 2000, issued May 15, 2007; *hereinafter* "Bechtolsheim") in view of U.S. Patent No. 5,918,021 to Aditya (filed June 3, 1996, issued June 29, 1999; *hereinafter* "Aditya"), and further in view of U.S. Patent No. 6,826,195 to Nikolich et al. (filed Dec. 28, 1999, issued Nov. 30, 2004; *hereinafter* "Nikolich"). The Examiner further rejected claims 15, 46, 62 and 80 under 35 U.S.C. § 103(a) as being unpatentable over Bechtolsheim in view of Aditya, and in further view of Nikolich and U.S. Patent Application Publication No. 2005/0010695 to Coward et al. (filed Aug. 12, 2004, published Jan. 13, 2005, continuation of 09/688,859 filed Oct. 17, 2000; *hereinafter* "Coward"). Bechtolsheim in view of Aditya and Nikolich fail to teach, suggest, or disclose the requirements of the pending claims. Coward, additionally, fails to overcome the limitations of Bechtolsheim, Aditya, and Nikolich.

Claim 1, for example, requires a router module removably coupled to a midplane separate from a plurality of removable interface cards, the router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit. Claim 1 also requires not only that the router module is removable from the midplane, but further that the midplane provides power from a power supply to the router module only when the router module is properly inserted into the midplane. Bechtolsheim, Aditya, and Nikolich, alone or in combination, fail to teach, suggest, or disclose these requirements of claim 1.

Bechtolsheim discloses a router 100 that includes a packet processing engine 120, a fast forwarding engine 140, and a set of input interfaces 111.[176] Bechtolsheim also discloses that input interfaces 111 of router 100 are connected to at least one network 160.[177] Therefore, Bechtolsheim fails to teach, suggest, or disclose a router module removably coupled to a

[176] Bechtolsheim, FIG. 1; col. 2, ll. 56–59.
[177] Bechtolsheim, FIG. 1; col. 3, ll. 11–12.

midplane, separate from a plurality of removable interface cards, as required by claim 1. Instead, Bechtolsheim specifically discloses that router 100 includes the set of input interfaces 111.[178]

Aditya discloses server 220 that includes removable network interface cards.[179] However, Aditya fails to disclose any sort of router module that includes, for example, a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module, as required by claim 1. As is well known in the networking art, a router performs very different tasks than a server, therefore one of ordinary skill in the art would not have modified the router of Bechtolsheim with the server of Aditya. Nevertheless, even if one of ordinary skill in the art had combined the teachings of Bechtolsheim with those of Aditya,[180] one would have merely arrived at a server device, with removable network interface cards,[181] that is in network communication with a router[182] that includes a set of input interfaces.[183] This combination, even if applied, fails to yield a router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module integrated into a single unit and that is separate from a plurality of removable interface cards, as required by claim 1.

Nikolich describes a chassis that includes slots for multiple modules.[184] Although Nikolich discusses several types of modules that can be inserted into the slots,[185] none of the modules discussed are a routing module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit, as required by claim 1. Nikolich states that a combination of various cards is required in order to effect switching at either the IP layer or the network layer.[186] Thus, although Nikolich describes a cluster of chasses that can simulate a router,[187] Nikolich fails to disclose or suggest a single unit that includes all of the elements necessary to enable routing, and especially the elements required by claim 1. Moreover, Nikolich states that the ports of the

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[178] Bechtolsheim, FIG. 1; col. 2, ll. 56–59.
[179] Aditya, col. 3, ll. 60–67; col. 4, l. 26.
[180] Appellant does not acquiesce that one of ordinary skill in the art would have found this combination obvious.
[181] Aditya, col. 3, ll. 60–67; col. 4, l. 26.
[182] *See* Aditya, col. 5, ll. 9–12.
[183] Bechtolsheim, col. 2, ll. 56–59.
[184] Nikolich, col. 3, ll. 41–42.
[185] Nikolich, col. 3, ll. 50–53.
[186] Nikolich, col. 2, ll. 10–16.
[187] *See, e.g.*, Nikolich, col. 7, ll. 25–31, 61–63; col. 8, ll. 1–3 (stating that "an entire chassis cluster may appear to be one managed element," and that a cluster of chasses "collectively function as a single router").

chasses are "distributed across remote locations,"[188] thus rendering impossible that the "router" discussed therein includes all of the elements integrated into a single unit that can be removably coupled to a midplane. Claim 1, on the other hand, requires a routing module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit.

For at least these reasons, none of Bechtolsheim, Aditya, or Nikolich, alone or in combination, teach, suggest, or disclose the requirements of claim 1. The Examiner admitted that Bechtolsheim fails to disclose a router module that is separate from the plurality of interface cards.[189] However, the Examiner cited Aditya to overcome this limitation of Bechtolsheim. As stated above, Aditya also does not disclose a router module including all of the elements required by clam 1. The Examiner also proposed without any sort of explanation whatsoever that server 120 of Aditya could act as a router module.[190] However, Aditya does not teach that server 120 could act as a router or perform routing functions. To the contrary, Aditya specifically teaches that server 120 interacts with routers, allowing the routers to perform routing, rather than that server 120 performing any sort of routing function.[191]

To the extent that Aditya discusses these routers with which server 120 interacts, Aditya fails to teach that any of the routers include a router module that integrates the elements required by claim 1 into a single unit that is separate from a plurality of interface cards, as required by claim 1. Moreover, Aditya fails to disclose or suggest a router module that is removably coupled to a midplane, as further required by claim 1. The Examiner's assertion that server 120 of Aditya corresponds to a router module is entirely unsupported by the disclosure of Aditya.

Moreover, even if one of ordinary skill in the art had replaced server 120 of Aditya with the router described in Bechtolsheim, as asserted by the Examiner,[192] one would merely have arrived at a router with removable interface cards. Bectholsheim in view of Aditya therefore fails to disclose or suggest a router module removably coupled to a midplane separate from a

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[188] Nikolich, col. 8, ll. 3–5.
[189] Final Office Action dated July 31, 2008, p. 6.
[190] *Id.*
[191] *See* Aditya, col. 5, ll. 9–11.
[192] Appellant does not acquiesce that one of ordinary skill in the art would have found this to be obvious, or even possible.

plurality of removable interface cards, the router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit as required by claim 1, even in the Examiner's asserted combination.

Nikolich fails to overcome these deficiencies of Bechtolsheim in view of Aditya relative to Appellant's claims. Nikolich teaches a chassis with slots for receiving various interface cards.[193] The Examiner asserted that it would be obvious to one of ordinary skill in the art to modify Bechtolsheim in view of Aditya to arrive at the requirements of claim 1. However, a device constructed according to the Examiner's proposed combination of Bechtolsheim in view of Aditya would not be an interface card that could be inserted into a chassis, as necessitated by the teachings of Nikolich.[194] As stated above, Bechtolsheim in view of Aditya discloses a server with removable interface cards. The Examiner is therefore proposing that the disclosure of Bechtolsheim in view of Aditya are sufficient for enabling one of ordinary skill in the art to condense an entire server architecture into a single card that can be inserted into a slot of the chassis of Nikolich.

However, neither Bechtolsheim nor Aditya, nor their combination, includes any such disclosure or suggestion. Instead, Aditya teaches that server 120 includes physical adapters 241 that interface with switch 250.[195] Moreover, Aditya teaches that physical adapters 241 receive cables, such as coaxial cable, twisted copper-wire, or optical fiber,[196] as opposed to any sort of mechanism for being coupled to a midplane, or the chassis taught by Nikolich. Therefore, the combination of Bechtolsheim, Aditya, and Nikolich fails to disclose or suggest a router module removably coupled to a midplane separate from a plurality of removable interface cards, the router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit as required by claim 1.

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[193] Nikolich, FIG. 4; col. 2, ll. 10–17.
[194] *See id.*
[195] Aditya, FIG. 3; col. 4, ll. 22–32.
[196] Aditya, col. 4, ll. 39–41.

The other independent claims, i.e. claims 32, 63, 71, 82, and 84, include requirements similar to a router module removably coupled to a midplane separate from a plurality of removable interface cards, the router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit. Therefore, similar remarks apply with respect to claims 32, 63, 71, 82, and 84. The dependent claims incorporate the requirements of the respective independent claims, therefore dependent claims 6–8, 10–15, 19–20, 25, 29–30, 39–44, 46, 56, 60–62, 64–70, 77–80, and 86 are also patentable. Moreover, the dependent claims include a number of requirements likewise not disclosed or suggested by the cited prior art. Selected dependent claims are addressed below under separate headings.

For at least these reasons, the claims are patentable under 35 U.S.C. § 103. That is, the applied prior art fails to render obvious claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86. Accordingly, the rejections of claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 under 35 U.S.C. § 103 are improper and must be reversed.

(Claims 15, 46, 62 and 80)

Claims 15, 46, 62, and 80 are patentable by virtue of the dependency upon the independent claims, i.e. claims 1, 32, 63, 71, 82, and 84, respectively. In addition, claims 15, 46, 62, and 80 are patentable for another reason. Therefore, Appellants have presented claims 15, 46, 62, and 80 under a separate heading.

For example, claim 15 requires a redundant router module to process the data packets and to forward the data packets between the removable interface cards in response to malfunction of the router module. The Examiner admitted that Bechtolsheim in view of Aditya and Nikolich fails to teach this requirement, but cited Coward as disclosing this requirement of claim 15.[197] In particular, the Examiner cited figure 18 of Coward. Figure 18 of Coward, however, clearly shows a redundant switch that is in a separate network location than the primary switch. Claim 15 specifically requires a redundant router module to process the data packets and to forward the

[197] Final Office Action dated July 31, 2008, p. 13.

data packets between the same removable interface cards as those to which the primary router module (of claim 1) forwards data packets. Coward, on the other hand, shows in figure 18 a first Ethernet switch and a second Ethernet switch that necessarily include distinct interface cards. This is because there are distinct links connecting the CPUs of figure 18 of Coward to the two Ethernet switches. Moreover, Coward states that the two devices are switches, which are layer two devices, as opposed to routers, which are layer three devices; devices at layer three perform different functions and are vastly more complicated than devices at layer two of the Open Standards Interconnection (OSI) Model. Accordingly, Coward fails to overcome the admitted defects of Bechtolsheim, Aditya, and Nikolich. Similar arguments apply with respect to claims 46, 62 and 80.

For at least these reasons, claims 15, 46, 62, and 80 are patentable under 35 U.S.C. § 103. That is, the applied prior art fails to render obvious claims 15, 46, 62, and 80. Accordingly, the rejections of claims 15, 46, 62, and 80 under 35 U.S.C. § 103 are improper and must be reversed.

CONCLUSION OF ARGUMENT

In view of Appellant's arguments, the final rejections of Appellant's claims are improper and should be reversed. Reversal of all pending rejections and allowance of all pending claims is respectfully requested. Appellant respectfully requests separate review by the Board for each of Groups 1–3 addressed below under separate headings.

Date: Oct. 28, 2008

By: _____

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APPENDIX: CLAIMS ON APPEAL

Claim 1 (Previously presented): A routing device comprising:

a midplane;

a power supply coupled to the midplane to supply power along the midplane;

a plurality of removable interface cards removably coupled to the midplane to communicate packets using a network; and

a router module removably coupled to the midplane separate from the plurality of removable interface cards, the router module comprising a packet forwarding engine, memory, a memory management unit, and an interface card concentrator module wherein the packet forwarding engine, memory management unit, and the interface card concentrator module are integrated into a single unit,

wherein the midplane provides power from the power supply to the router module only when the router module is properly inserted into the midplane,

wherein the interface card concentrator module receives packets from at least two of the removable interface cards,

wherein contents of the received packets are stored in the memory,

wherein the memory management unit generates notifications based on keys of the received packets and forwards the notifications to the packet forwarding engine,

wherein the packet forwarding engine performs route lookups for the packets based on the keys in response to the notifications, and

wherein the interface card concentrator module sends the packets from the memory to the removable interface cards as output bound packets based on the route lookups performed by the packet forwarding engine in response to the notifications.

Claim 2–5 (Canceled).

Claim 6 (Previously Presented): The routing device of claim 1, wherein the interface card concentrator assembles the output bound packets from data stored in the memory and forwards the output bound packets to the plurality of removable interface cards.

Claim 7 (Previously Presented): The routing device of claim 1, wherein the interface card concentrator processes inbound packets received from the plurality of removable interface cards to remove the keys from the inbound packets, and stores data from the processed inbound packets in the memory.

Claim 8 (Previously Presented): The routing device of claim 1, wherein the memory comprises an SDRAM device.

Claim 9 (Canceled).

Claim 10 (Previously Presented): The routing device of claim 1, wherein the notifications are generated based on extracted information that includes at least one of source address information, destination address information, source port information, and destination port information.

Claim 11 (Previously presented): The routing device of claim 1,

wherein the packet forwarding engine is configured to select the routes for the packets received from the at least two different ones of the plurality of removable interface cards by referencing a forwarding table based on the extracted information, and

wherein the forwarding table stores the route information for forwarding data packets received from any of the plurality of removable interface cards.

Claim 12 (Previously Presented): The routing device of claim 11, further comprising a routing engine to store a routing table.

Claim 13 (Previously Presented): The routing device of claim 11, further comprising another memory to store the forwarding table.

Claim 14 (Previously presented): The routing device of claim 11, wherein the memory management unit is configured to forward the packets to the plurality of removable interface cards based on the selected route.

Claim 15 (Previously Presented): The routing device of claim 1, further comprising a redundant router module to process the data packets and to forward the data packets between the removable interface cards in response to malfunction of the router module.

Claim 16–18 (Canceled).

Claim 19 (Previously presented): The routing device of claim 1, wherein the memory management unit is configured to provide packet data to the packet processing circuit.

Claim 20 (Previously presented): The routing device of claim 1, wherein the memory is further configured to store output bound data.

Claim 21–24 (Canceled).

Claim 25 (Previously presented): The routing device of claim 10, wherein the packet forwarding module is configured to select the route by performing a longest prefix match based on the extracted information.

Claim 26–28 (Canceled).

Claim 29 (Previously presented): The routing device of claim 1, wherein the packet processing circuit is configured to remove an L2 header from an incoming data packet.

Claim 30 (Previously presented): The routing device of claim 1, wherein the packet processing circuit is configured to build L2 headers for the output bound packets.

Claim 31 (Canceled).

Claim 32 (Previously presented): A routing arrangement comprising:

a crossbar arrangement; and

a plurality of routing devices coupled to the crossbar arrangement, at least one routing device comprising:

a midplane;

a power supply coupled to the midplane to supply power along the midplane;

a plurality of removable interface cards removably coupled to the midplane to communicate data packets using a network; and

a router module removably coupled to the midplane separate from the plurality of removable interface cards,

wherein the midplane provides power to the router module from the power supply, only when the midplane is properly inserted into the midplane,

wherein the router module performs route lookups for a first set of the data packets received from the network by a first one of the removable interface cards and for a second set of the data packets received from the network by a second one of the removable interface cards to select routes for the data packets and to forward the data packets between the removable interface cards,

wherein the router module comprises a system control module that performs the route lookups, memory, a memory management circuit, and at least one concentrator module that receives the data packets from at least the first one and the second one of the removable interface cards, and

wherein the system control module, the memory management circuit, and the concentrator module are integrated into a single unit,

wherein the router module receives packets from at least two of the removable interface cards,

wherein contents of the received packets are stored in the memory,

wherein the memory management circuit generates notifications based on keys of the received packets and forwards the notifications to the system control module,

wherein the system control module performs route lookups for the packets based on the keys in response to the notifications, and

wherein the concentrator module sends the packets from the memory to the removable interface cards as output bound packets based on the route lookups performed by the system control module in response to the notifications.

Claim 33–38 (Cancelled).

Claim 39 (Previously Presented): The routing arrangement of claim 32, wherein the memory comprises an SDRAM device.

Claim 40 (Previously Presented): The routing arrangement of claim 32, wherein the memory management circuit is further configured to provide the notifications to the system control module based on information extracted from incoming data packets.

Claim 41 (Original): The routing arrangement of claim 40, wherein the extracted information includes at least one of source address information, destination address information, source port information, and destination port information.

Claim 42 (Previously Presented): The routing arrangement of claim 40, wherein the system control module is configured to select a route by referencing a forwarding table based on the extracted information, wherein the forwarding table stores the route information for forwarding data packets received from any of the plurality of removable interface cards.

Claim 43 (Previously Presented): The routing arrangement of claim 42, further comprising a routing engine to store a routing table.

Claim 44 (Previously Presented): The routing arrangement of claim 42, further comprising a memory to store the selected route in the forwarding table.

Claim 45 (Cancelled).

Claim 46 (Original): The routing arrangement of claim 32, further comprising a redundant router module to process the data packets and to forward the data packets between the interface modules in response to malfunction of the router module.

Claim 47–55 (Canceled).

Claim 56 (Previously presented): The routing arrangement of claim 32, wherein the router module is configured to select the route by performing a longest prefix match based on the extracted information.

Claim 57–59 (Canceled).

Claim 60 (Previously presented): The routing arrangement of claim 32, wherein the packet processing circuit is configured to remove an L2 header from an incoming data packet.

Claim 61 (Previously presented): The routing arrangement of claim 32, wherein the packet processing circuit is configured to build L2 headers and rewrite L3 headers for the output bound packets.

Claim 62 (Previously presented): The routing arrangement of claim 32, further comprising a redundant router module to process the data packets and to forward the data packets between the interface modules in response to malfunction of the router module.

Claim 63 (Previously presented): A router comprising a midplane, a plurality of interface cards coupled to the midplane, a power supply to provide power along the midplane, and one hardware board integrally housing an interface concentrator that provides electrical interfaces to connect to the midplane to receive incoming packets from the plurality of interface cards via the midplane, a packet processing circuit, memory, a memory management circuit, and a route lookup circuit separate from the interface cards to perform route lookups to select routes for a first packet and a second of the incoming packets received from a network by different ones of the plurality of interface cards

wherein the midplane is configured to provide power to the one hardware board from the power supply, only when the one hardware board is properly connected to the midplane at the electrical interfaces,

wherein the interface concentrator receives the data packets from at least two of the interface cards,

wherein contents of the received data packets are stored in the memory,

wherein the memory management circuit generates notifications based on keys of the received data packets and forwards the notifications to the route lookup circuit,

wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications, and

wherein the interface concentrator sends the data packets from the memory to the interface cards as output bound packets based on the route lookups performed by the route lookup circuit in response to the notifications.

Claim 64 (Original): The router of claim 63, wherein the memory management circuit is configured to provide incoming data to the packet processing circuit.

Claim 65 (Previously Presented): The router of claim 63, wherein the memory management circuit is configured to provide a notification to the route lookup circuit based on information extracted from the incoming data packets.

Claim 66 (Previously Presented): The router of claim 65, wherein the extracted information includes at least one of source address information, destination address information, source port information, and destination port information for each of the incoming packets.

Claim 67 (Previously Presented): The router of claim 65, wherein the route lookup circuit is configured to select the routes by referencing a forwarding table based on the extracted information, wherein the forwarding table stores the route information for forwarding data packets received from any of the plurality of interface cards.

Claim 68 (Original): The router of claim 67, wherein the route lookup circuit is configured to select the route by performing a longest prefix match based on the extracted information.

Claim 69 (Original): The router of claim 63, wherein the packet processing circuit is configured to remove an L2 header from an incoming data packet.

Claim 70 (Previously Presented): The router of claim 63, wherein the packet processing circuit is configured to build L2 headers and rewrite L3 headers for the output bound packets.

Claim 71 (Previously presented): A method of manufacturing a routing device, the method comprising:

providing a plurality of interface modules to communicate data packets using a network;

coupling a midplane to the plurality of interface modules;

coupling a power supply to the midplane; and

coupling a single router module to the midplane,

wherein the midplane is configured to provide power to the single router module from the power supply, only when the single router module is properly inserted into the midplane,

wherein the router module is configured to perform route lookups for data packets received from different ones of the interface modules via the midplane to select routes for the packets in accordance with route information associated with the network and forward the packets back to the interface modules by way of the midplane, and

wherein the router module comprises a system control module, memory, a memory management unit, and at least one concentrator module integrated into a single unit separate from the interface modules

wherein the concentrator module receives the data packets from at least two of the interface cards,

wherein contents of the received data packets are stored in the memory,

wherein the memory management circuit generates notifications based on keys of the received data packets and forwards the notifications to the system control module,

wherein the system control module performs route lookups for the data packets based on the keys in response to the notifications, and

wherein the interface concentrator module sends the data packets from the memory to the interface cards as output bound packets based on the route lookups performed by the system control module in response to the notifications.

Claim 72–76 (Cancelled).

Claim 77 (Previously presented): The method of claim 71, further comprising configuring the memory management circuit to provide the notifications to the system control module based on information extracted from incoming data packets.

Claim 78 (Previously Presented): The method of claim 77, further comprising configuring the system control module to select a route by referencing a forwarding table based on the extracted information, wherein the forwarding table stores the route information for forwarding data packets received from any of the plurality of interface modules.

Claim 79 (Previously Presented): The method of claim 78, further comprising configuring a routing engine to store a routing table.

Claim 80 (Original): The method of claim 71, further comprising configuring a redundant router module to process the data packets and to forward the data packets between the interface modules in response to malfunction of the router module.

Claim 81 (Canceled)

Claim 82 (Previously presented): A method of manufacturing a routing arrangement, the method comprising:

providing a crossbar arrangement; and

coupling a plurality of routing devices to the crossbar arrangement, at least one routing device comprising:

a midplane;

a plurality of interface cards to communicate data packets using a network, wherein each of the plurality of interface cards are coupled to the midplane;

a power supply coupled to the midplane to supply power along the midplane; and

a router module separate from the plurality of interface cards to process the data packets and to forward the data packets between the interface cards, wherein the router module is coupled to the midplane,

wherein the midplane is configured to provide power to the router module from the power supply, only when the router module is properly inserted into the midplane,

wherein the router module is configured to perform route lookups for the data packets received from different ones of the interface cards to select routes for the packets in accordance with route information associated with the network, wherein the router module includes a packet processing circuit, memory, a memory management circuit, and a route lookup circuit integrated into a single module,

wherein the packet processing circuit receives the data packets from at least two of the interface cards,

wherein contents of the received data packets are stored in the memory,

wherein the memory management circuit generates notifications based on keys of the received data packets and forwards the notifications to the route lookup circuit,

wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications, and

wherein the packet processing circuit sends the data packets from the memory to the interface cards as output bound packets based on the route lookups performed by the route lookup circuit in response to the notifications.

Claim 83 (Canceled)

Claim 84 (Previously presented): A routing arrangement comprising:

a plurality of routing devices coupled in a crossbar arrangement, at least one routing device comprising:

a midplane,

a plurality of interface modules removably coupled to the midplane to communicate data packets using a network,

a power supply coupled to the midplane to provide power along the midplane,

a router module removably coupled to the midplane to receive the data packets from at least two different ones of the interface modules, wherein the router module is configured to perform route lookups for the data packets received from the at least two interface modules to select routes for the packets in accordance with route information associated with the network,

wherein the midplane is configured to provide power to single router module from the power supply, only when the router module is properly inserted into the midplane; and

a switch arrangement coupled to the plurality of routing devices and configured to switch control from a first routing device to a second routing device, wherein the router module includes a packet processing circuit, memory, a memory management circuit, and a route lookup circuit integrated into a single module,

wherein the packet processing circuit receives the data packets from at least two of the interface cards,

wherein contents of the received data packets are stored in the memory,

wherein the memory management circuit generates notifications based on keys of the received data packets and forwards the notifications to the route lookup circuit,

wherein the route lookup circuit performs route lookups for the data packets based on the keys in response to the notifications, and

wherein the packet processing circuit sends the data packets from the memory to the interface cards as output bound packets based on the route lookups performed by the route lookup circuit in response to the notifications.

Claim 85 (Canceled)

Claim 86 (Previously presented) The routing arrangement of claim 84, wherein each of the plurality of routing devices includes a respective router module comprising a respective packet processing circuit, respective memory, a respective memory management circuit, and a respective route lookup circuit integrated into a respective single module.

APPENDIX: EVIDENCE

None

APPENDIX: RELATED PROCEEDINGS

None